

WHAT IS CLAIMED IS:

1. A vessel filter comprising a first region and a second region, the filter movable between a collapsed position for delivery to the vessel and an expanded position for placement within the vessel, the first region having a filter portion having a converging region at a first end portion to direct particles toward the center of the filter, the second region being flared in the expanded position to have a transverse dimension increasing toward a second end portion opposite the first end portion, the second region including a vessel engaging portion at the second end portion and including a plurality of spaced apart struts with adjacent struts being joined.
2. The vessel filter of claim 1, wherein the adjacent struts are joined by two connecting struts, each of the two connecting struts extending inwardly toward the other connecting strut.
3. The vessel filter of claim 2, wherein the connecting struts converge at their ends to form a substantially V-shaped configuration.
4. The vessel filter of claim 1, wherein one or more of the struts terminates in vessel engaging hooks.
5. The vessel filter of claim 1, wherein the struts divide at an end portion to form two connecting struts which extend away from each other, each connecting strut extending toward a connecting strut of an adjacent strut.
6. The vessel filter of claim 5, wherein the connecting struts of adjacent struts are joined at an intermediate region and further extend away from each other to join the connecting strut emanating from the same strut.
7. The vessel filter of claim 6, wherein the connecting struts form a closed oval like region.

8. The vessel filter of claim 1, wherein the filter is formed from a laser cut tube and composed of shape memory material.
9. The vessel filter of claim 1, wherein the filter includes at the first end portion multiple recesses axially spaced from one another and configured to receive a removing instrument to remove the filter.
10. The vessel filter of claim 1, wherein adjacent struts are interconnected by strut portions extending towards one another to form a V-like section.
11. The vessel filter of claim 1, wherein adjacent struts are interconnected by struts portions which initially extend away from each and then extend towards one another, forming a closed geometric configuration.
12. A vessel filter comprising a first region and a second region, the filter being movable between a collapsed position for delivery to the vessel and an expanded position for placement within the vessel, the filter being substantially bell-shaped in the expanded position, the first region of the filter having a filter portion having a converging region at a first end portion, the second region of the filter having a mounting portion for mounting the vessel filter within the vessel, the mounting portion including a flared region, the second region including a plurality of struts extending from the filter portion and dividing into oppositely directed struts at a first end and then converging with an oppositely directed strut of an adjacent strut.
13. The vessel filter of claim 12, wherein the mounting portion includes vessel engaging members to enhance retention of the filter.
14. The vessel filter of claim 12, wherein oppositely directed struts emanating from the strut are rejoined to each other at a second end.

15. The vessel filter of claim 12, wherein one or more of the struts terminates in vessel engaging hooks.

16. A vessel filter comprising a first region and a second region, the first region including a filtering section for capturing particles and having a first transverse dimension, the second region including a mounting section for mounting the filter within the vessel, the mounting section having a second transverse dimension greater than the first transverse dimension and including vessel engaging structure to retain the filter, the first region further including a plurality of cutouts configured to receive a removal tool such as a retrieval snare to remove the filter from the vessel, the cutouts being axially spaced.

17. The vessel filter of claim 16 wherein the cutouts are helically formed.

18. A vessel filter comprising a first region and a second region, the first region including a filtering section for capturing particles and having a first transverse dimension, the second region including a mounting section for mounting the filter within the vessel, the mounting section having a second transverse dimension greater than the first transverse dimension and including vessel engaging structure to retain the filter, the first region further including a retrieval region, the retrieval region including a hook having a cutout exposing an internal annular surface, the annular surface dimensioned to receive a portion of a retrieval sheath.

19. The vessel filter of claim 18, wherein the retrieval region includes a radiusued region having first and second curved surfaces extending distally inwardly.

20. A vessel filter comprising a first region and a second region, the first region including a filtering section for capturing particles and having a first transverse dimension, the second region including a mounting section for mounting the filter within the vessel, the mounting section having a second transverse dimension greater than the first transverse dimension and including vessel engaging structure to retain the filter, the

first region further including a retrieval region, the retrieval region including a hook at a proximal end thereof and a curved wall spaced axially from the hook to provide a camming surface to facilitate entry into a retrieval sheath.

21. A vessel filter comprising a first region and a second region, the first region including a filtering section for capturing particles and having a first transverse dimension, the second region including a mounting section for mounting the filter within the vessel, the mounting section having a second transverse dimension greater than the first transverse dimension and including vessel engaging structure to retain the filter, the vessel engaging structure including a first set of hooks and a second set of hooks, each set of hooks being positioned at an end of the mounting section, the first set of hooks having a transverse dimension greater than a transverse dimension of the second set of hooks.
22. The vessel filter of claim 21, wherein the mounting section includes a plurality of struts and one of the hooks extends from the strut, an end portion of each strut defining a plane and each hook extending from the strut lying in the plane of the strut.
23. The vessel filter of claim 22, wherein the first set of struts is axially offset from the second set of struts.
24. The vessel filter of claim 23, wherein the filter is formed from a laser cut tube, the tube cut to form a set of struts, wherein each of the hooks of the second set of hooks are formed of a transverse dimension substantially corresponding to a transverse dimension of one strut and each of the hooks of the first set are formed of a transverse dimension substantially corresponding to a transverse dimension of two adjacent struts.
25. The vessel filter of claim 23, wherein an outer surface of the second set of hooks substantially conforms to an inner surface of the first set of hooks.